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# COMMON FIRST REVISION EXAMINATION - 2024

Std - XII

Time : 3.00 Hours

## CHEMISTRY

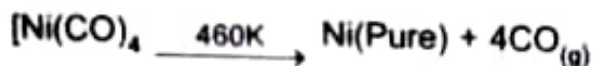
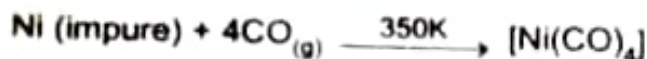
Marks: 70

Part - I

I. Answer all the questions:

15 x 1 = 15

1. The following set of reactions are used in refining Nickel



- a) liquation                      b) van-Arkel process    c) Zone refining                      d) Mond's process
2. During electrochemical extraction of Aluminium 10%  $\text{CaCl}_2$  is added to the solution?  
 a) lower the melting point of mixture                      b) lower the boiling point of mixture  
 c) to reduce alumina ✓                      d) none
3. Which of the following compound is known as Burnt Alum?  
 a)  $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$                       b)  $\text{K}_2\text{SO}_4 \cdot (\text{NH}_4)_2 \text{SO}_4$   
 c)  $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3$  ✓                      d)  $\text{K}_2\text{SO}_4 \cdot \text{Al}(\text{OH})_3$
4. Among the following the correct order of acidity is  
 a)  $\text{HClO}_2 < \text{HClO} < \text{HClO}_3 < \text{HClO}_4$                       b)  $\text{HClO}_4 < \text{HClO}_3 < \text{HClO}_2 < \text{HClO}$   
 c)  $\text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2 > \text{HClO}$  ✓                      d)  $\text{HClO}_2 > \text{HClO} > \text{HClO}_3 > \text{HClO}_4$
5. Permanganate ion changes to .... in alkaline medium.  
 a)  $\text{MnO}_4^{2-}$                       b)  $\text{Mn}^{2+}$  ✓                      c)  $\text{Mn}^{3+}$                       d)  $\text{MnO}_2$
6.  $[\text{Xe}]4f^75d^16s^2$ , it is the electronic configuration of which element.  
 a) Eu ✓                      b) Gd                      c) Tb                      d) Dy
7. The fraction of total volume occupied by the atoms in a FCC is  
 a)  $\frac{\sqrt{3}\pi}{8}$                       b)  $\frac{\pi}{6}$                       c)  $\frac{\pi}{4}$                       d)  $\frac{\pi}{3\sqrt{2}}$
8. If the ratio of radius of cation and anions  $\left(\frac{r_+}{r_-}\right)$  in ionic crystal is 0.325, then the structural arrangement of ionic crystal is  
 a) Tri-angular planar    b) Tetrahedral                      c) Octahedral                      d) Cubic
9. After two hours a radioactive substance becomes (1/64)th of original amount, then half life (in min) is  
 a) 60 minutes ✓                      b) 30 minutes                      c) 20 minutes                      d) 45 minutes
10. If the rate constant of a reaction is  $5.8 \times 10^{-2} \text{ mol lit}^{-1} \text{ s}^{-1}$  then order of the reaction will be  
 a) first order                      b) zero order                      c) second order ✓                      d) third order
11. The value of ionic product of water  $K_w$  at  $50^\circ\text{C}$   
 a)  $1.00 \times 10^{-14}$                       b)  $1.14 \times 10^{-15}$                       c)  $2.71 \times 10^{-16}$                       d)  $2.71 \times 10^{-14}$
12. The solubility product ( $K_{sp}$ ) of  $\text{Mg}(\text{OH})_2$   
 a)  $S^2$                       b)  $4S^3$  ✓                      c)  $27S^4$                       d)  $108S^5$
13. Which of the following compound does not react with sodium metal?  
 a)  $(\text{CH}_3)_2\text{O}$                       b)  $\text{CH}_3\text{CH}_2\text{OH}$                       c)  $\text{CH}_3\text{COOH}$                       d)  $\text{C}_6\text{H}_5\text{OH}$

14. In which of the following reaction new Carbon-Carbon bond will be formed?  
 a) Clemmensen reaction  
 b) Wolff-Kishner reduction ✓  
 c) Kolbe reaction  
 d) None of the above
15. Which of the following undergoes Haloform reaction?  
 a)  $\text{CH}_3\text{CH}_2\text{OH}$   
 b)  $\text{CH}_3\text{CHO}$   
 c)  $\text{CH}_3\text{COCH}_3$  ✓  
 d) all of these

## Part - II

II. Answer any six Questions. Question No. 24 is compulsory.  $6 \times 2 = 12$

16. Write various test to differentiate alcohol and phenol.  
 17. How do you prepare Urotrophine? Write its uses.  
 18. Define ionic product of water.  
 19. Explain Pseudo first order reaction with an example.  
 20. Explain the following terms with suitable example. a) Gangue B) Slag  
 21. Write a short note on Hydroboration.  
 22. Why zirconium and Hafnium exhibit similar properties?  
 23. Write the reason for the anomalous behaviour of Nitrogen.  
 24. Sodium metal crystallise in BCC structure with the edge length of the unit cell is  $4.3 \times 10^{-8}$  cm. Calculate the radius of sodium metal atom.

## Part - III

III. Answer any six questions. Question No. 33 is compulsory.  $6 \times 3 = 18$

25. Explain briefly about the seven types of Unit cell.  
 26. Write the equation involved in the preparation potassium dichromate.  
 27. What are the different types of silicones?  
 28. Give two equation to illustrate the chemical behaviour of Phosphine.  
 29. What is the role of adding sodium cyanide in froth floatation process?  
 30. What are the factors affecting the rate of reaction?  
 31. Explain Saytzeff's rule with an example.  
 32. The concentration of hydroxide ion in a water sample is found to be  $2.5 \times 10^{-8}$  M. Identify the nature of solution.
33. Acetic acid  $\xrightarrow{\text{PCl}_5}$  A  $\xrightarrow{\text{Pd/BaSO}_4}$  B  $\xrightarrow{\text{CH}_3\text{MgBr/H}_3\text{O}^+}$  C. Identify A, B and C.

## Part - IV

IV. Answer the following questions.  $5 \times 5 = 25$

34. a) Write any five electrophilic substitutions reaction occurs in Phenol. (5) (OR)  
 b) Write mechanism involved in Aldol condensation reaction. (5)
35. a) i) Calculate the % efficiency of packing in case of FCC. (3)  
 ii) Write the difference between Frenkel and Schottky defect. (2) (OR)  
 b) i) What are the effects of Lanthanoid contractions? (3)  
 ii) Draw the structure of  $\text{MnO}_4^-$  and  $\text{Cr}_2\text{O}_7^{2-}$  ions. (2)
36. a) Describe the structure of Diborane (5) (OR)  
 b) Define Ostwald dilution law. Derive an expression for calculating pH of weak electrolyte using Ostwald dilution law.
37. a) Write down observation made by you on Ellingham diagram. (5) (OR)  
 b) The rate constant of a reaction at 400K and 200K are  $0.04\text{s}^{-1}$  and  $0.02\text{s}^{-1}$  respectively. Calculate the activation energy. (5)
38. a) Derive an expression for calculation of pH of solution obtained by hydrolysis of salt of strong acid and weak base. (OR)  
 b) An alkene (A) on ozonolysis gives propanone and aldehyde (B). When (B) is oxidised (C) is obtained (C) is treated with  $\text{Br}_2/\text{P}$  gives (D) which on hydrolysis gives (E). When propanone is treated with HCN followed by hydrolysis gives (E). Identify A, B, C, D and E.